

Name:

Date:

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**PART A** In the space on the left, write the letter of the term or phrase which **best** completes the statement or answers the question (1 mark each).

- \_\_\_\_ 1. Which of the following is a scalar quantity?  
a. Speed  
b. Velocity  
c. Acceleration  
d. Position
- \_\_\_\_ 2. The slope of a distance-time graph represents ...  
a. Acceleration  
b. Displacement  
c. Velocity  
d. Speed
- \_\_\_\_ 3. A horizontal line on a velocity-time graph represents a(n) ...  
a. Zero velocity  
b. Constant velocity  
c. Constant acceleration  
d. Object at rest
- \_\_\_\_ 4. An object is dropped and hits the ground 2s later. What is its velocity when it hits the ground?  
a. 19.6 m/s  
b. 4.9 m/s  
c. 19.6 m/s<sup>2</sup>  
d. 4.9 m/s<sup>2</sup>
- \_\_\_\_ 5. West is commonly represented as \_\_\_\_\_ and North is commonly represented as \_\_\_\_\_.  
a. Positive; negative  
b. Negative; positive  
c. Positive; positive  
d. Negative; negative
- \_\_\_\_ 6. A car moving at a constant forward velocity will have a \_\_\_\_\_ slope on a displacement-time graph.  
a. Positive  
b. Negative  
c. Vertical  
d. Horizontal

- \_\_\_ 7. A resting object increasing to a velocity of +12 m/s in 3s has an acceleration of ...  
a. 4 m/s  
b. 36 m/s  
c. 4 m/s<sup>2</sup>  
d. 36 m/s<sup>2</sup>
- \_\_\_ 8. Which of the following is a vector quantity?  
a. Speed  
b. Distance  
c. Time  
d. Velocity
- \_\_\_ 9. A person travels 10 km away from home and returns. The trip distance is \_\_\_ and the displacement is \_\_\_\_\_.  
a. 10 km; 20 km  
b. 20 km; 10 km  
c. 0 km; 20 km  
d. 20 km; 0 km
- \_\_\_ 10. If you count 7 pulses in your wrist in 6 seconds, your period is ...  
a. 6 s  
b. 0.86 s  
c. 1.2 s  
d. 7 s

**PART B** In the space provided mark each of the following as true or false. (1 mark each)

- \_\_\_ 1. Speed and velocity are the same in direction but different in magnitude.
- \_\_\_ 2. Instantaneous acceleration is always zero.
- \_\_\_ 3. Acceleration can be represented by a horizontal line on a velocity-time graph.
- \_\_\_ 4. Frequency measures the number of cycles in a certain time interval.
- \_\_\_ 5. Velocity is calculated by dividing speed by time.
- \_\_\_ 6. A negative acceleration also means a negative velocity.
- \_\_\_ 7. Time is a scalar quantity.
- \_\_\_ 8. Change in velocity can be calculated by multiplying acceleration by change in velocity.
- \_\_\_ 9. Time is graphed on the y-axis of a velocity-time graph.
- \_\_\_ 10. A horizontal line means an object is at rest on a displacement-time graph.

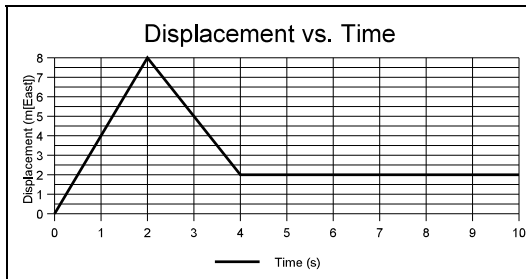
**PART C** In the space provided, match each term or phrase with the best definition. (1 mark each)

- |                              |  |
|------------------------------|--|
| ___ 1. Origin                | A. A quantity that describes magnitude and direction.                  |
| ___ 2. Position              | B. An attractive force that acts between two or more masses.           |
| ___ 3. Scalar                | C. A constant change in velocity over time.                            |
| ___ 4. Displacement          | D. A point of reference.   |
| ___ 5. Constant velocity     | E. The time interval between two repeating events.                     |
| ___ 6. Vector                | F. A vector that describes a specific point relative to the origin.    |
| ___ 7. Gravity               | G. The distance and direction from one point to another.               |
| ___ 8. Distance              | H. Describes length, but not direction, between two points.            |
| ___ 9. Constant acceleration | I. Produces a horizontal line on a velocity-time graph.                |
| ___ 10. Period               | J. A quantity that describes magnitude but does not include direction. |

**PART D** Each of the following questions requires a short or calculated answer.

1. A rock is dropped from a cliff and strikes the ground below with a velocity of 94 m/s. How long was the rock in the air? Show all your calculations for full marks. (2 marks)
  
  
  
  
  
  
  
  
  
  
2. A motorbike accelerates negatively at  $13 \text{ m/s}^2$  for 3.5 seconds. Calculate the motorbike's change in velocity. Show all your calculations for full marks. (2 marks)
  
  
  
  
  
  
  
  
  
  
3. An object moves 42m [E] in 16 seconds. Calculate its velocity and show your work. (1 mark)

Use this velocity-time graph to answer questions 4–9.



For each of the time intervals below, calculate the displacement, and include the direction. (1 mark each)

4. 0s–2s

5. 2s–4s

6. 4s–10s

For each of the time intervals below, calculate the velocity of the object from the graph above, remembering to describe the velocity as East or West as applicable. (1 mark each)

7. 0s–2s

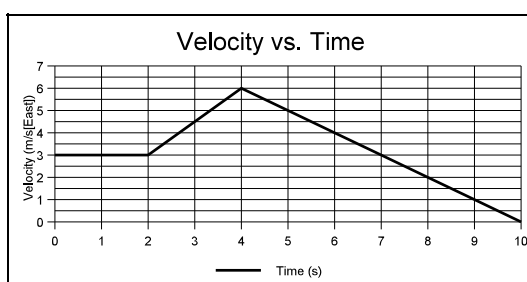
8. 2s–4s

9. 4s–10s

10. An object moves 18m [S] in 4 seconds. Calculate its velocity and show your work for full marks. (1 mark)

11. An object has a constant speed of 8 m/s for 4 s. Calculate its distance travelled and show your work for full marks. (1 mark)
12. An object travels north at 40km/h. How long would it take the object to travel 220 km? Show your work for full marks. (1 mark)

Use this velocity-time graph to answer questions 13–15. Calculate the acceleration for each of the time intervals indicated. Show all your work for full marks. (2 marks each)



13. 0s–2s
14. 2s–4s
15. 4s–10s